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(54) Title: ESSENTIAL AND IMPORTANT GENES OF PSEUDOMONAS AERUGINOSA AND THE USE THEREOF TO DESIGN OR IDENTIFY ANTIBACTERIAL AGENTS

(57) Abstract: The invention includes a database of candidate essential genes in *Pseudomonas aeruginosa*, as well as otherwise important genes that, when mutated, lead to a growth attenuated phenotype. Such genes and mutants of such genes are important for identifying antibacterial agents suitable for treating and preventing *Pseudomonas aeruginosa* infections. The invention includes methods for confirming the essentially or importance of candidate genes, as well as methods for utilizing those genes to screen for new antibacterial drugs. The invention also includes the antibacterial agents identified using the disclosed methods, as well as methods of using the same for treating and preventing *Pseudomonas* infection.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/35518

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12N 15/74  
US CL : 435/471

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/6, 471; 514/2, 44; 707/100, 102

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
STN/CAS, Medline, U.S. Patents, Derwent

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,037,137 A (BENTON et al.) 14 March 2000 (14.03.2000), see entire document.	89-95 100-103
Y	US 5,876,931 A (HOLDEN et al.) 02 March 1999 (02.03.1999), see entire document.	89-95 100-103
Y	US 5,706,498 A (FUJIMIYA et al.) 06 January 1998 (06.01.1998), see entire document.	89-95 100-103
Y	COSTERTON et al. Bacterial Biofilms: A common cause of persistent infections. Science, 21 May 1999, Vol. 284, pages 1318-1322.	89-95 100-103

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

### \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

06 September 2003 (06.09.2003)

Date of mailing of the international search report

14 NOV 2003

Name and mailing address of the ISA/US

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/35518

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claim Nos.: 61 and 87  
because they relate to subject matter not required to be searched by this Authority, namely:  
The instant claims are drawn to transposon insertion maps of *Pseudomonas aeruginosa*, which constitute mere presentations of information (see PCT rule 39).
2. ☒ Claim Nos.: 1,3-10,12,13,15-28,30-37,39-46,48,49,51,52,54,55,57-60,62,64,65,67,68,70,73,74,76,77,83-86,88,96-99 and 104-107  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
Please See Continuation Sheet
3. ☒ Claim Nos.: 2 11 14 29 38 47 50 53 56 63 66 69 71 72 75 78-82  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐  
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

PCT/US02/35518

## C ntinuation of Box I Reason 2:

The instant claims encompass the polypeptides set forth in Table 1, as well as variants of said polypeptides as set forth in the claims. However, Table 1 merely identifies the polypeptides by GenBank ID Number, protein name, gene name, and/or an arbitrary designation set forth by Applicants. The application does not specifically identify the sequences of the molecules encompassed by the claims. Regarding the identification of molecules by GenBank ID Number, it is respectfully pointed out that the any information related to the disclosed GenBank ID Numbers goes beyond the filed disclosure. Therefore, the sequences of the claimed polypeptides are not present in the application and no meaningful search can be performed for these claims.